Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME 6.] NEW-YORK, MAY 17, 1851. [NUMBER 35.

THE
Scientific American,
CIRCULATION 16,000.
PUBLISHED WEEKLY
At 128 Fulton, street, N. Y., (Sun Building,) and 13 Court street, Boston, Mass.

BY MUNN & COMPANY,

The Principal Office being at New York
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TERMS---$2 a-year---$1 in advance and the remainder in 6 months.

Rail-Road News.

Pacific and Mississippi Railroad.

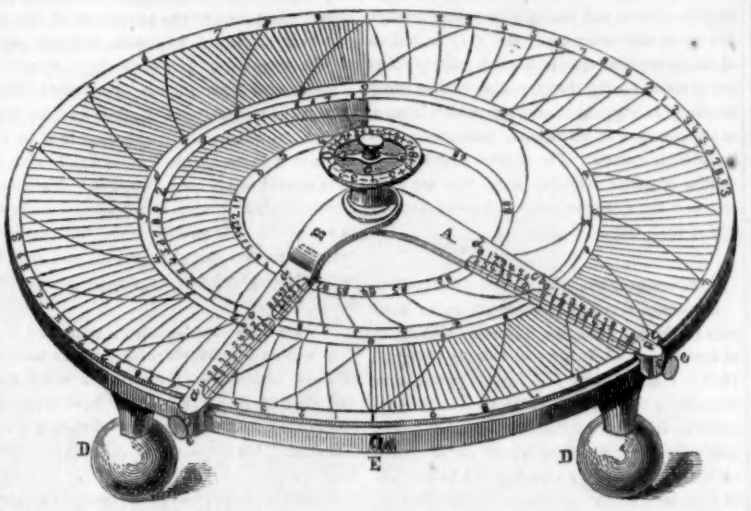
Professor Forrest Shepherd, in a letter to the New Haven Palladium says:—

"In relation to the projected railroad from the Mississippi River to the Pacific, that the road can be constructed from the Pacific to the Mississippi, without crossing any mountains, or encountering so much snow as between Boston and Albany. He says this route is from the head or southern portion of Pularo Valley, through Walker's Pass, thence to the Mejaree River, thence north-eastward to high grounds on the tributaries of the Rio Colorado, thence crossing the said river above the great Carion, thence east to Pilot Mountain near Sante Fe, passing Pilot Mountain on the north side, thence to Santa Fe and the Mississippi at Apple Creek below St. Louis, where there is a good landing and open navigation to New Orleans through the winter, and of course a road on the bank of the Mississippi to St. Louis. The route will be 600 or 800 miles nearer than any other, has wood and water nearly the whole distance, and abundance of stone and coal at Santa Fe. The above route will accommodate both North and South, New Mexico and California, and ocean steamers will soon render a trip from San Francisco and Astoria as light a matter as at present from Buffalo to Chicago or Mackinaw. The route further north is very objectionable on account of the snow ever on the table lands on the head waters of Feather River. I have travelled over snow apparently undrifted, varyfrom 12 to 20 feet in depth, in the month of June. Fine specimens of native silver, reported, too, to be abundant, have been brought to me from the line of the Southern route."

He adds:—

"I have now explored California for nearly two years, and I can truly say it is a land of wonders. There are fresh flowers every month in the year, and Winter now wears the bloom of Spring. I have found water falls three and four times as high as Niagara, natural bridges of white marble, far surpassing in beauty that of Rockbridge in Virginia. Some thousands of gold bearing veins, inexhaustible quantities of iron and chrome ores, lead, bismuth and quicksilver, most beautiful porcelain clay, and in short almost everything that can bless an industrious and enterprising people. In one valley I found more than forty springs of a temperature over 100° Fahrenheit. In another valley sixteen geysers, like the famous one in Iceland. In this famous abode of Vulcan the rocks are so hot that you can stand upon them but a short time, even with thick boots on. The silicious rocks are bleached to snowy whitness, and brecciated and conglomerate rocks are now actually orming. The roar of geysers at times may be heard a mile or more, and the moment is one of intense interest as you approach them.

NYSTROM'S NEW CALCULATING MACHINE.



This machine is the invention of Mr. J. W. Nystrom, of Philadelphia, and was patented in March last. The inventor is a learned and very ingenious engineer, and this machine is the most important one ever brought before the public. We cannot even give all the examples of its powers we would like, for want of room, rather because of the extent of its operations, but after a description we will present a few.

The Calculating Machine represented in the accompanying engraving, consists of a round disc of metal or other suitable material, mounted upon three feet, D D; it has two graduated arms, A and B, on which are marked *a b c d*, representing the four different figure circles on the disc. In the centre of the disc is a screw, C, to clamp the two arms, A and B, together; when clamped they can be moved freely around the disc. The circle *a* (marked on the arms) contains the numbers for Multiplication and Division; the circle *b* contains the numbers for Addition and Subtraction, and also the Logarithms for the numbers in circle *a*. The circles *c* and *d* are for Trigonometrical calculations, of which the numbers in circle *c* are an angle—the numbers in circle *a* showing the length of its sines; the numbers in circle *d* are the complement angles for circle *c*, and circle *a* its cosines.

The large figures in the circle *a* represent the first figure of a question, the small figures the second; the third figure will be found on the arms, and the fourth between the figures on the arms.

In the accompanying engraving, the arm, B, is set on 1449, (circle *a*), its logarithm= 3·16106 (circle *b*). The arm shows an angle =8° 20′ (circle *c*), which sines=0·1449 (circle *a*). The complement angle=81° 40′ (circle *d*), which cosines=0·1449 (circle *a*).

The calculation with this instrument is based upon the principle of logarithms, though the logarithm in general cases need not be observed, but when the number of figures in the result is uncertain a correct account must be kept of the index of the factors; for that purpose there is a small hand on the top of the screw, C, which is to be moved by hand for each operation with the arms. Also any power or roots of numbers can be easily extracted. The most difficult or simple calculation may be computed, from the simple addition and subtraction of numbers to the most complicated business accounts, and the higher branches of mathematical trigonometrical equations, are alike easily calculated.

At the end of each arm is a screw, *e*, to fasten the arms in any particular point of the disc.

MULTIPLICATION.—Rule 1.—16×12=192. Set the arm, A, on the factor 16 (circle *a*) and the arm, B, on 1; fasten the two arms with the screw, C; move them until the arm B comes to the next factor, 12, the arm, A, shows the product=192. If more than two factors are to be multiplied together, consider the product of two factors as a new factor, and continue the multiplication by the next factor, as aforesaid.

DIVISION.—Rule 2. 365 : 15=24·33. Set the arm A on the dividend, 365, and the arm B on the divisor, 15; fasten the arms with the screw, C; move them until the arm B comes to 1; the arm A shows the quotient= 24 33. If the dividend contains more than one factor, multiply them as in rule 1, the product is the dividend. If, also, the divisor contains more than one factor, consider the quotient of the dividend and the first factor in the divisor as a new dividend, and continue the division by the next factors, as said in rule 2.

PROPORTION.—Rule 3. $a : b = c : d$. Set the arm, A, on the first term, *a*, and the arm B on the second term, *b*, fasten the arms with the screw, C; move them until the arm A comes to the third *c*, the arm B shows the fourth term, *d*. If the third term, *c*, is unknown, set the arm, B, on the fourth term, *d*, and the arm, A, will show the third term, *c*. If the arms be moved to any position on the disc, the numbers within the same will still remain in the same proportion as $a : b$. This fact makes it convenient to manage vulgar fractions.

EXTRACTING ROOTS.—Rule 4. $n\sqrt{m}=x$.—Divide the logarithm (circle *b*) for the number, *m*, by the index of the root, *n*: that is to say, the index for the logarithm is kept with the small hand on the screw, C, and the mantissa on circle *b*, and the number *m* on circle *a*—the quotient (circle *b*) is the logarithm for *x*, (circle *a*). [The mantissa is the decimal part of a logarithm.]

TRIGONOMETRY.—Rule 5. Sin. $C=\frac{c \text{ sin. } A}{a}$ Set the arm A on the number *c*, and the arm B on the number *a*; fasten the screw, C; move the arms until the arm B comes to the angle A (circle *c*); the arm A shows the angle C (circle *c*). These operations are done in a few seconds, without having recourse to tables of the trigonometrical lines or logarithms; the answer gives not only the sine C, but also the angle C itself, expressed in degrees, minutes, and seconds, and in the operation sine A need not be observed, merely use the angle A. Any of the trigonometrical lines will be found on the machine—for instance, the area of a right angled triangle, $Q=\frac{c^2 \text{ cot. } C}{2}$ only the value of *c* and C is given; the operation on the machine is done in a moment.

Example 1.—What is the "pitch" of a propeller 9 feet 3 inches in diameter, the angle of the blades in the circumference being 53° 45′? Pitch=$3{\cdot}14\times9{\cdot}25\times\frac{\text{cos. } 53° 45'}{\text{sin. } 53° 45'}$=21ft. 6 in. Set the arm A on 3·14, the arm B on 1 (circle *a*); fasten the arms with the screw, C; move them until the arm B comes to 9·25; fasten the arm A with the screw *e*; loosen the screw C, then move the arm B to 53° 45′ (circle *c*); fasten the arms with the screw, C, then loosen the screw *e*, and move the arms until the arm B comes to 53° 45′ (circle *d*),—the arm A shows the pitch=21·49 (circle *a*).

Example 2.—What is the angle V of the blades in the circumference of a propeller with a pitch=2½D? Cot. $V=\frac{P}{\pi D}=\frac{2{\cdot}5D}{\pi D}=\frac{2{\cdot}5}{3{\cdot}14}$ Set the arm A on 2·5, the arm B on 3·14 and fasten the arms with the screw C; move them until the arm B shows the same angle on circle *c* as the arm A shows on circle *d*, and it will be found that the angle V=51° 30′.

A Calculating Machine for general business use will be about 9 inches in diameter; those for astronomical and the more particular branches, where a greater number of figures are required, will be about 2 feet in diameter, and the engraving of course will vary. Another, for approximating calculations, intended to be placed in pocket-books, will be about 3 inches in diameter, printed on paper, the arms also being made of paper.

It is intended to publish a book to accompany the machine, containing numerous examples and directions that will enable any person to use the same. This instrument was exhibited at the Annual Exhibition at the Franklin Institute, in 1849–50.

The inventor, not having the time to spare which this instrument deserves to have devoted to it, offers it to any person who will undertake the manufacture of it, or will buy the patent right; especially to any person engaged in the new art of Electrotyping: such persons will find it of great utility, as they can electrotype the disc, and thus save the expense of engraving it and by saving this it will enable the manufacturer to sell it at a greatly reduced rate, and bring it within the reach of every business man. Direct letters to J. W. Nystrom, 31 Union street, Philadelphia.

To Analyse an Alloy of Silver and Gold.

Laminate the alloy, and treat it by nitric acid, till nitrous gas ceases to be disengaged; the residium well washed, and heated red, gives the quantity of gold. Next pour hydrochloric acid into the solution to throw down the silver, wash the precipitate, dry and weigh it; 100 parts of chloride of silver are equivalent to 75·3 of silver. If the proportion of silin the alloy be very small, the nitric acid will only effect its partial solution; in that case add as much silver to the alloy by fusion as will make it at least equal to three-fourths of the mass. Account must be taken of the quantity of silver thus added at the end of the operation.

To Analyse an Alloy of Silver and Copper.

Dissolve the alloy in nitric acid, and dilute the solution with water, throw down the hydrochloric acid, and filter the liquor, washing the precipitate till ammonia ceases to produce a blue color; then mix the washings with the filtered liquor, reduce it by evaporation, and add an excess of hydrate of potassa or soda to separate the deutoxyde of copper, from which the quantity of copper in the alloy is ascertained, as that of the silver is learnt from the chloide.

Miscellaneous.

Foreign Correspondence.

LONDON, April 25th, 1851.

"The work goes bravely on" in the departments of the Great Exhibition Building. On the day I penned my last letter, the veteran Duke of Wellington, "the Iron Captain," visited the Exhibition, and after walking through it for some time, he at last arrived at the French department, where he paused to observe one of the exhibitors removing from an oak case various costly articles of gold and silver, and just at that very moment he uncovered a pair of equestrian statuettes of the Duke himself, and his once redoubtable opponent on the field of Waterloo, Napoleon Bonaparte. The old General smiled at the incident, while the sharp-eyed Frenchman looked at the statuettes and then at the Duke with an enquiring look, when the veteran nodded his assent to the resemblance. In a few moments the General was surprised and surrounded by Frenchmen. They politely raised their caps, and with true military salute he passed on to the next department.

The opening of the Exhibition is to take place on the first, as mentioned in my last. It will be a grand affair. The throne is now erecting for the Island Queen near to the centre of the large transept. A platform is to be erected, and the Archbishop of Canterbury, all the officers of State, and foreign ambassadors will attend in full dress. There will be splendid music, and after a number of ceremonies, the Queen, Prince Albert, the officers of State, and all the Commissioners will form a procession through the "wide expanse" of the building, after which the exhibition will be declared open for the public.

Owing to a profound degree of dissatisfaction on the part of the exhibitors of articles of sculpture and statuary with the proposed arrangement of Sir R. Westmacott, who had been charged with the superintendance of the sculpture room, the greater proportion have been withdrawn by the exhibitors, and places have been obtained for them in the transept and nave of the building. It appears that the plan proposed by Sir Richard Westmacott was to place the whole of the articles of sculpture, without regard to the nature of the subject, upon counters of a uniform height, which was absurd on the face of it. The artists, on the other hand wished to place their productions on pedestals adapted to the size and character of the subjects, which was only just and reasonable. This proposal was not acceded to; and many, if not most, of the articles were accordingly removed. Among the groups and figures which have emerged from what the artists have just termed "the condemned cell," to the liberty of the transept and nave, are—MacDowall's "Satan tempting Eve," and "Michael and Satan," "Dr. Jenner," "Jacob and Rachel," and various others. There is now a somewhat numerous collection of articles of sculpture in the transept. A group in marble, by Engel, executed for Prince Albert, attracts considerable notice. The group represents an Amazon rescuing her sister-in-arms from an Argonaut who had carried her captive.

As the art of ship-building is one for which our countrymen are distinguished, and as alleged improvements always attract their attention, especially in New York, where so much is at stake in ships, I see it mentioned in some of the Liverpool papers, that an improvement has been made there by a Mr. McKimm, which is thus described:—

"The object of the projector appears to have been to form an uninterrupted, unbroken, and continual line of binding, to extend from one end of the vessel to the other, and to connect every frame of timber together, in its passage along the side of the ship, in such a way as to render the framework inextensible and incompressible, and to give the greatest amount of stability to the frame-work, independent of any support from the plank-work, and to complete the object without wounding the frame with bolts, &c. With this object in view he has succeeded in accomplishing the desired effect by the introduction of two arched lines, constructed of iron plate-work, the one arch extending upwards, the other extending downwards as far as the bilge of the vessel; the arches being reversed, one chord line of iron plate-work answers both arched lines, and materially assists in the longitudinal tie, which extends in a vertical longitudinal position from stem to stern-post, forming within themselves the contour of the beam of a steam-engine within the frame of the vessel; one beam being so formed in each side of the vessel and continued round from stem to stern-post, where they terminate, and are bolted together through the stem and stern-post; the very formation of which tends to counteract the different forces exerted on the body, and opposing every tendency to hogging or sagging, which is more or less common to all vessels, particularly colonial built vessels. The scheme appears well worthy of notice amongst those who are interested in the construction, safety, and durability of such vessels."

EXCELSIOR.

FORKLAND, Greene Co., Ala., April 21.

MESSRS. EDITORS—I intrusted some business in the hands of the "Inventors' National Institute," at Baltimore, Md., in 1849 and 1850. I inclosed to Mr. Jas. Coppuck, Corresponding Secretary, Inventors' National Institute, Baltimore, Md., a description and rough sketched drawings of an improvement on Water Wheels. I also inclosed $15 or $20 as fees, &c., for examining into the novelty of my alleged improvements, the receipt of which was acknowledged; and they informed me that it was their decided opinion that I was entitled to a patent, but it would require some time to examine fully into the matter, to give me all the information I requested, which they would do in a few weeks. More than a year has now passed, and I have heard nothing further from them; I have written several times since, and have not received any answer from them. I am therefore at a loss to know whether the fault is in them or in the mail.

I have come to the conclusion that it is likely the Institute has fallen through, and it is nobody's business to answer my communications directed to the Institute. I will therefore take the liberty of inquiring of you, if you can inform me whether the Inventors' National Institute, at Baltimore, still continues to transact business as Patent Agents. Respectfully yours, J. H****.

[The above letter we publish for the purpose of making a few remarks in regard to the matter. The letter tells its own story, and there is no doubt our correspondent has been genteelly swindled under the garb of a high-sounding title. We do not know that the Corresponding Secretary is at all chargeable for the evident misappropriation of the funds; the presumption is that he was a salaried officer, but we advise our correspondent to address him a letter of inquiry at Mount Holly, N. J., where, we feel sure, he formerly resided, and we presume Mr. Coppuck will afford him some information to whom he can apply for satisfaction.—[ED.

Doings at Washington.

MR. EWBANK, &c.—The correspondent of the Tribune says:—

As to Mr. Ewbank, the charges against him are finally set at rest. They have been examined carefully by his chief, Mr. Secretary Stuart, and Mr. Attorney-General Crittenden, who pronounce them in detail as either unfounded or frivolous.

The absolute facts with reference to the appointment of Mr. Ewbank have never been known. They are simply these as I have them, not from Mr. Ewbank, but from the highest possible authority. Mr. Secretary Ewing saw his work upon Hydraulics, and considering it a scientific performance, sent to the author to inquire if he would accept the place of Commissioner of Patents. Upon understanding that he would, the matter came up in Gabinet, and the appointment was made. I do not think that at the time it was known that he was born in England. When opposition was made on that account, he found defenders, some of whom it was erroneously supposed aided in procuring his appointment.

I see it stated in some papers that Mr. Ewbank had been ordered to pay the amount he expended in publishing his official report to the Secretary of the Interior with reference to the extension of certain patents. This is not the case. Mr. Ewbank's accounts for the quarter are now before the accounting officers, and have not yet been acted upon. There is, therefore, as yet, no decision with reference to the validity of the items complained of.

[The official report mentioned here, we have made some enquiries about, and find it to be very different from the idea conveyed in the above. It relates to the publishing of the report in a number of papers in different parts of the country, for which they were ordered to send their bills to the Patent Office. Charges were preferred against him for this, we believe, but we always thought that he did not intend to charge the Patent Fund with it, as it related to his own business. We therefore concluded that the charges were preferred in a mistake. However, we are not acquainted with private doings in the matter, and do not pretend to "be wise beyond what is written."

Incrustations on Steam Boilers.

The incrustations which form in the interior of steam boilers have given rise to much discussion, and many substances have been recommended for the purpose of obviating a result attended with so much difficulty to the engineer.

Several attempts have been made to deprive water of the saline matter which it holds in solution before it is introduced into the boilers, but these have been without effect, and the main object seems now to be to prevent the incrustations adhering so firmly to the boiler that their removal will not be attended with much trouble.

Coal tar was recommended a year or two ago in the Scientific American, I believe, as being most effective in preventing these incrustations; but little notice seems to have been taken of it, and potatoes, sugar, &c., were recommended and tried, but did not entirely succeed.

In the city of Louisville, where the water is more highly charged with lime than it is in many other places, this inconvenience is severely felt; there, after a trial of various substances, they find the coal tar to succeed better than any other article.

The following is the manner of using it: after the boiler has been cleaned, about one pint of the tar is introduced into it, after which it is poured into the heater, and thus reaches the boiler. In Louisville, one pint a week, introduced into the heater, is sufficient for a double flued boiler twenty-eight feet long.

During the use of this substance the lime is found in the boilers in large flakes, or if not absolutely loose, is removed by the application of the slightest force.

In one establishment this agent has been used for a period of six months, and in another for more than a year.

Coal tar is a very economical substances for this purpose, especially in cities where gas is manufactured from coal.

CHARLES W. WRIGHT, M. D.

Cincinnati, 1851.

Good Parsnips.

Parsnips are an excellent vegetable, both for the table and for the feeding of farm stock. We believe our farmers do not pay so much attention to the raising of this root as they should do. We have lately received a sample of a few from Mr. Wm. Taylor, of Schenectady, N. Y., of the English kind, which are of a very superior flavor, and far better than those which are common among us.

Improvement in Making Flour.

Whatever adds to or improves the quality of anything useful to man is of great importance, and is particularly worthy of attention, especially when the improvement relates to such an article as the "staff of life"—flour. An improvement relating to our improved system of milling has lately been somewhat prominently brought under our notice in a pamphlet published by the inventor and patentee, Mr. D. P. Bonnel, of Tecumseh, Michigan.

This improved process consists in separating the starch from the glutinous substances contained in the grain, and submitting the latter to a second active grinding or scouring process. This is effected by placing a set or run of auxiliary mill stones, (under a very rapid motion, from 300 to 500 revolutions per minute,) so as to intercept the whole body of the offal on its passage from the first or superfine bolts, to the return or duster bolts. The auxiliary mill may be adapted in size to the work to be done; a stone 36 inches in diameter being sufficient for a common 4 run mill. It should be driven with a spur wheel or gearing of some kind, as a belt is liable to slip and lose motion. The eye of the stone should be made very conical, and the irons put in so as to leave as much room in the eye as possible—the whole of which should be covered with smooth sheet iron or tin. The stones should be strongly banded, hung and balanced very nicely, dressed true and smooth, with a pretty large proportion of deep furrows about the eye or centre. The feeding is supplied and made very uniform and perfect, by substituting a large funnel for the common "hopper, shoe and damsel." Around the tube of the funnel is cut a screw which passes through a nut set immediately over the runner's eye. This tube reaches down in the eye of the runner until it comes nearly upon the top of the bale, which should be formed so as to fit, or nearly so, the opening of the tube; then, by turning the funnel, the screw widens or contracts the opening at the top of the bale, admitting more or less feed, as desired.

In using this improvement, the first grinding should be done with reference to the starch entirely, always being careful to reduce no part of it so fine as to destroy its granular qualities. This done, the bolting is free, and the starch is bolted out in passing through the first or superfine bolts. The remainder of the the stuffs is sent directly to the auxiliary mill, where it is ground to any degree of fineness the miller may desire. It is then passed through the lower merchant or duster bolts, and such portion of it sent back to the same as may be necessary, until all the flour is brought out clear from "specknis," when it is continually sent to the cooler or first bolts, to be uniformly incorporated with the superfine flour.

This method of a second grinding is stated to make better fine flour out of fewer bushels of wheat than by the old processes. This we can believe, much of the real muscle producing food being lost in the bran; it is not the whitest flour that is the best by any means. In the United States we have 8,000,000 surplus barrels of flour annually, and this must find a market somewhere. In Europe, we have to compete with Russia and Germany, and it is only by improvements in milling that we can expect to compete with them. This is a subject worthy of the most earnest attention of our millers and farmers.

The Great Bell at Notre Dame.

The large bell of the Cathedral of Notre Dame was rung on Good Friday, after a silence of three years, caused by repairs in the belfry. A large crowd assembled on the Parvis to hear it. The bell is called Emmanuel, was cast in 1682, and Louis XIV, named it in the christening ceremony. Formerly sixteen men were required to ring it, but owing to an improvement in the hanging, four now suffice. The relics of the Cathedral were, on Good Friday, carried round in solemn procession after a sermon of the Abbe de Ravignaa. The President of the Republic was present, and there was a vast congregation.

Copper Boilers.

It is stated that copper boilers are henceforth to be used on board the steamers of the Royal Navy, as their greater durability has been found to render them cheaper in the end than iron boilers, of which the first cost is small.

M. Gayss, a Hungarian traveller in Africa, has discovered the tomb, quadrant, &c., of Jaques Compagnon, a French traveller who was lost in the interior of Senegambia, in 1760.

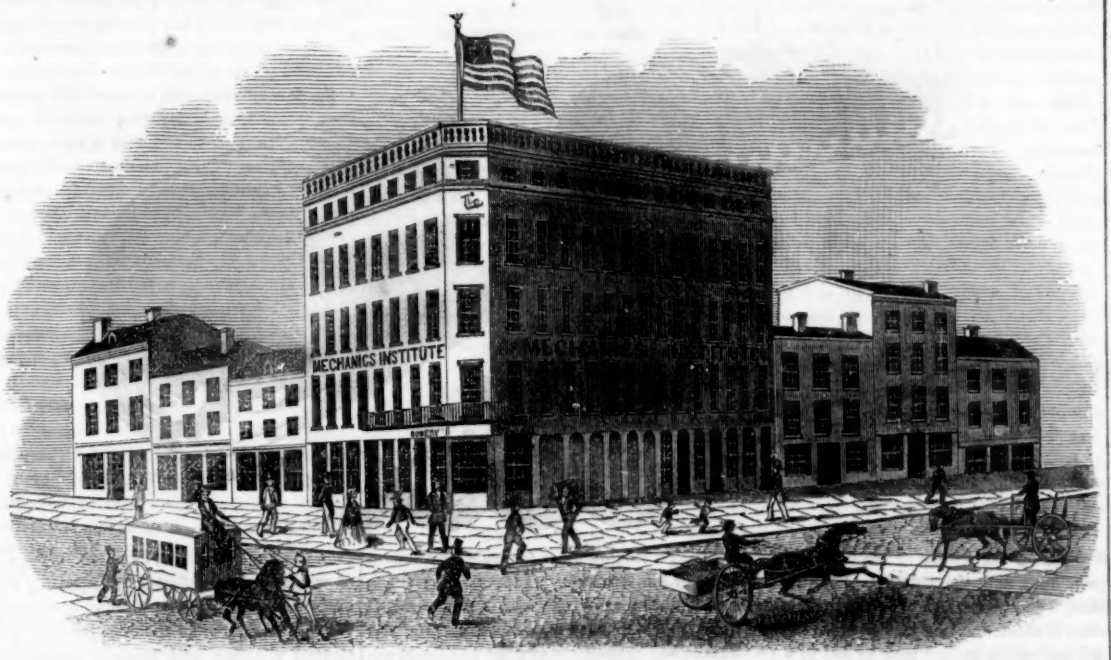
NEW YORK MECHANICS' INSTITUTE.

This Institute has lately removed to the large building at the junction of Division street and the Bowery, as represented in the engraving below. This spacious building, comprising four floors, each containing 3,500 square feet, has been taken on a lease of five years, and it is resolved to devote the whole of this large space, except so much as is required for the Library and Reading Room (which has been tastefully fitted up on a part of the first floor), to the purpose of a Polytechnic Institute like that in London. An opportunity will thus be afforded to Mechanics, Inventors, and Artists, at all times, to bring into public notice the products of their ingenuity and skill; and to the public not only to see collected in one place specimens of rare and excellent workmanship in the various branches of art, but to inspect the actual operations of workmen in the more curious, new, and ornamental fabrications. A steam engine will be provided to drive such as require power, and for the proper display of the machinery on exhibition. Familiar lectures will be delivered as frequently as may be, on chemical, mechanical, and other scientific subjects, and illustrative of the objects and operations exhibited, and every effort will be made to render the exhibition worthy of this Institute, and of our city and country.

The Exhibition will be permanently open after this week, and we cordially commend it to the public. Those who desire to exhibit machinery in this city, will find power and room there to do so, at all times.

There is nothing on this continent, except the Annual Fairs held in our large cities, in the least resembling this contemplated exhibition; and they, being held for a few weeks only in each year, cannot afford to the public or to inventors and artisans, the advantages which will thus be extended to them.

But along with the permanent Polytechnic Exhibition, we would sincerely recommend the instituting of a great Annual Exhibition or Fair, by the Institute, to be held about the latter part of August or the early part of September every year. A Fair, conducted in an impartial manner, and by such an intelligent



examining corps as can be furnished by the many able mechanicians belonging to the Institute, is demanded of the city of New York, to expiate the many wrongs she has done to exhibitors, who have come here from a distance to other Fairs, and to show to the whole country that we have the clear ringing metal of worth among our celebrated engineering community—many of whom belong to the Mechanics' Institute. In order to avoid the errors into which other Fair-holding institutions have fallen, let us give a few words of advice, as we have paid particular attention to such matters, and have heard (as we always do hear) the complaints of those who have been wronged and dealt with in a partial manner.

1st. The Mechanics' Institute should not look to mere money-making for the purpose of supporting a few favored men, as its first object. The payment of the expenses—such as fair salaries for the permanent offices, is necessary, but no more. Many institutions become mere hives of drones, being managed by a few very incompetent men, so far as scientific and mechanical qualifications are concerned.

2nd. The examining corps must be able and impartial men; they must not say to one man "pay for the gold and you will have a gold medal next year; this year we have given one to your neighbor, because we gave him only a diploma last year, and he has paid for the metal."

3rd. The Institute should conduct its Fairs without respect to persons—not forbidding one man to exhibit one thing with some quack excuse, and allowing another man to exhibit as much quackery as he pleases.

4th. To do their duty without fear. They cannot expect to please all, and we would say, "do not try it by subterfuge and favor.

5th. Let all the actions of the Institute be above board, upright in principle, downright in action.

The City of New York can support one of the best Mechanics' Institutes in the world. The Institute, about which we are now speaking, has made a grand move in the right direction; we like to see it, and as long as it is conducted well we will heartily advocate the good cause. We have occupied, and will always occupy, the position of freedom from partial influences, so as to be independent of all parties and cliques, and thereby untrammelled by any considerations but truth and right. When we see wrong done, it makes no matter what the Institute may be, we will speak out as we always have done. We like the plan of the Mechanics' Institute, it is a good one,—let it be carried out perseveringly and impartially, and great good will result from it. Let our mechanics support it with heart and hand; let them consider their honor at stake in doing so. No city in the world presents so many advantages as this for conducting such an institution. Its officers are not retired generals, nor do such titles afford certificates of promotion to judge of the merits of works of art and engineering. Many of our most able engineers are members of it, and it is to be hoped that all will become so.

The Institute occupies four large rooms; on the first floor above the stores are the Library and Reading Rooms, and there is to be a fountain for hydraulic machines, &c. On the second floor, steam engines, machinery, and working models will be exhibited. On the third is the Lecture Room, where machinery, if necessary, will be exhibited; the fourth floor will be devoted to classes in modelling, and the exhibition of less finished articles.

We would state that there is a most excellent school connected with the Institute, in which the children of the members receive a good education on reasonable terms. We have, upon a number of occasions, spoken well of the object of this Institute, and within the past three years have happily witnessed its exit from the cellar in the City Hall to its present large and respectable rooms. If five thousand of our young mechanics would walk up and put down $3 each, before the Fourth of July, they would become members, and thus render to themselves the privilege of the use of a large library. They would afterwards be able to keep Independence Day with a clear conscience.

More about Severson's Bridge.

Two weeks ago we published an illustrated description of the iron Bridge invented by Mr. Benjamin Severson, of Schenectady, N. Y. As there are some principles mentioned in Haupt's late work on Bridge Building, as new and which attracted Mr. Severson's attention some years ago, and are embraced in his bridge, we publish the following about the *quarter* braces and refer our readers to the engraving to make a re-examination.

The quarter-braces, made of wire cables or wrought-iron rods, starting from the ends of the upper arcs and connected at different points to the lower parts of the voussoirs, add much to the strength of the structure. At the middle of the length of the truss, the positive and negative forces act horizontally, and at the ends act vertically on the abutments. The amount of vertical pressure at intermediate points, is in proportion to the distance of each point from the ends or middle of the truss; and, regarding these braces as resultants, acting in the direction of their length, an analysis of the forces will show that the amount of vertical support given by each brace, will also be in proportion to the amount of vertical support at their several points of connection with the lower part of the truss. And these braces being connected to the end pieces, opposite the ends of the upper rigid arc, and by means of screws made to press firmly against the ends of the arc, the arcs being cambered, it is evident that any downward bending of the structure will produce a horizontal thrust of the ends of the arcs against the upper ends of these braces; thus regulating the intensity of their tension, by the amount of pressure of a load on the bridge,—hence, the amount of vertical support, rendered by each brace at its lower end, will be governed by the amount of thrust or pressure received at its upper end, from the end of the arc bearing against it; thus the tension of the braces will at all times act with an intensity in proportion to the pressure of a load on the bridge.

In the construction of his iron bridge, Mr. Severson has assumed that in the truss without the quarter braces, when the load does not bend the truss, the forces will act horizontally at the middle of its length and vertically at the ends. That at intermediate points their moment or intensity will be proportional. That at the outer ends of the upper arc or rail, the horizontal forces will be zero—liable however to be moved or thrust outward horizontally in consequence of the increased horizontal pressure at the middle, produced by an increase of load, such as would bend the cambered truss downwards. Now, to prevent this horizontal outward movement at the ends of the upper arc, and the consequent racking of voussiors, he uses the quarter braces, and by having their ends attached against the ends of said arcs, and at different points to the lower part of the truss, the degree of inclination of each brace will ensure an amount of vertical support, in proportion to the amount of vertical pressure occurring at their several points of connection at their lower ends. Whatever amount of vertical pressure is intercepted by these braces, will be conveyed through their length without further intermingling with the truss, and lodged at their upper ends, directly over the abutments, thence downwards. And at the same time that these braces meet and dispose of the requirements of the unequal vertical pressure, they will equalize the horizontal forces in the upper arcs, changing their ends from zero, to a pressure if not quite equal to that of the middle. And yet the original direction of the forces, to the extent they are left to act on each part, will not be changed, though their intensity will be equalized.

It has been supposed by many that the science of Bridge Building was perfect, that nothing new could be elicited, that all the resources of mechanical philosophy had been expended, and every pressure and thrust to sustain a bridge was well known, but we see now many new ideas advanced and we have no doubt but they are correct ones. The innumerable quantity of bridges which have been constructed on our railroads have incited the genius and directed the attention of observing and skillful men to every point at issue and not at issue in Bridge Building. Mr. Herman Haupt, of Penn., in his late able work on Bridges, advances some excellent ideas from from page 63 to 170, and he distinctly points out a vertical strain, the very thing which is provided against by the counter braces in Severson's bridge.

Plank Roads in Missouri.

The St. Louis Intelligencer says:—A belief in the importance and value of plank road seems to be fast gaining ground, and already we find several about being commenced in our State. Among others, we note the Ste. Genevieve, Iron Mountain, and Pilot Knob plank road. This company have secured the service of Mr. Kirkwood. the Chief Engineer of the Pacific Railroad Company, under whose directions a reconnoissance of the country has just been made, and the instrumental survey about being commenced. It is the intention to push this work to completion as fast as possible, and the contract is to be made in July next. The capital stock has been subscribed. We understand the report of the reconnoissance is very favorable, and that the practicability and value of the proposed road is undoubted. The distance of Ste. Genevieve to the Iron Mountain is about 45 miles, with a branch of nine miles to the Pilot Knob, the route of the road passing through a fine agricultural country, where there is an abundance of oak and pine timber of good quality.

We believe the company purpose building branches to the lead mines in the neighborhood of Frederickton, and also to Potosi. Farmington lies on the main route.

A rare literary curiosity is noticed by the Philadelphia North American as being in the possession of Mr. E. Waterman, of that city. It is a vellum volume done in the year 1200, long before the art of printing was discovered, and the type-like clearness, regularity and compactness of the lettering, as well as the exquisite delicacy and beauty of the ornamental writing in colors, which illuminates every page of the book, constitute it one of the most remarkable relics that have descended to us from the times anterior to types and printers.

New Inventions.

Improved Machine for Bending Felloes

Mr. Andrew M. Johnston, of St. Georges, New Castle Co., Deleware, has invented and applied for a patent for an improved machine for bending felloes for wheels of carriages, wagons &c., and which should receive no small attention. The principle of the invention consists in forcing the felloe timber between two curved curbs placed upon a bed-piece, the outer or larger curb being firmly secured to it. After the felloe timber is forced between the curbs, it is secured by clamps to the inner or smaller curb, and the smaller curb with the felloe attached is removed from the bed-piece by removing bolts which hold it to the same. The felloe timber is forced out of a narrow box before entering the curbs, or the timbers may pass between rolls which will answer the same purpose.

Improved Grass and Grain Cutter.

Mr. Wm. C, Betts, of Brooklyn, Kings Co., N. Y., has made a valuable improvement on machines for cutting grain, &c., for which he has taken measures to secure a patent. He employs a revolving cutter, by which the grass or grain is made to fall over on the platform without the aid of a conveyor reel. It also works with less friction than a commonly constructed reciprocating cutter. He also employs a series of rakes upon an endless chain, to carry off the grain from the platform and deposit it on the ground in bunches. The machine is guided in its motion by a set of guide rollers.

New Board Fence.

A new mode of constructing fences has been invented by Mr. J. Berdan, of Plymouth, Michigan, the principal features of which are not a little novel. By his plan, a good substantial and economical fence can be constructed of boards without posts. The boards for the construction of this fence have notches cut in them near their ends, and they are locked together in such a manner as to form a worm or zig-zag fence. The boards are supported in the middle by stakes passing down each side and secured together by clamps drawn together by a wedge. A brace or rider passes between the stakes resting upon the clamps, thus adding to the height and strength of the fence. The inventor has taken measures to secure a patent.

Improvement in Hanging Picker Staves in Looms.

Mr. Geo. W. Perry, of Thompson, Windham Co., Conn., has taken measures to secure a patent for a new method of hanging the picker staves of looms, which deserves attention. Each picker stave is hung on two radius rods which are attached to fixed centres on the frame of the lay, being connected by joint pins, one at the lower and the other at a short distance from it. The effect produced by this arrangement causes the end of the staff which acts upon the shuttle to move in a right line parallel to the raceway, the two radius rods producing a parallel motion without any other device for controlling it.

New Grain Cleaner.

Mr. George Wilkes, of Louisville, Ky., has invented and taken measures to secure a patent for certain new and useful improvements in machines for cleaning grain, whereby it is stated, "very beneficial results are obtained." He employs a cylindrical screen provided with revolving beaters working in connection with a fan blast and a number of flat inclined screens, which afford an increased screening surface and a very effectual action within a comparatively small space.

Heating Railroad Cars.

A Belgian engraver, M. Blacher has introduced, says the "Precurseur d'Anvers," a method of heating the cars of a railway train, by carrying off the smoke of the locomotive through iron pipes placed in them.—[Ex.

[This is a borrowed idea, taken from our columns, away over to Europe and made into a new invention for the Flemings. This invention is fully illustrated and described on page 49, Vol. 2, Sci. Am.

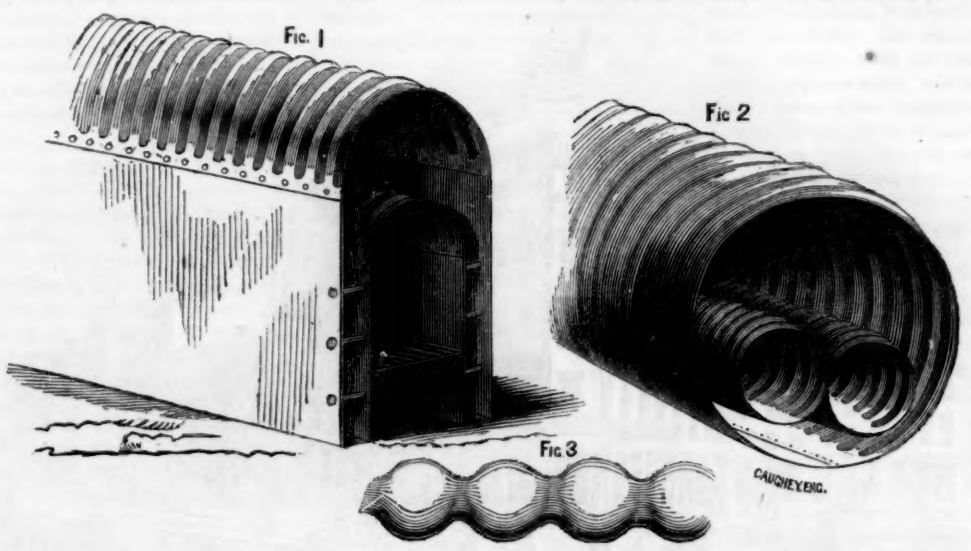
PATENT CORRUGATED BOILER PLATES.

The accompanying engravings represent the application of the new invention of Mr. Richard Montgomery, of this city, to the construction of steam boilers. Fig. 1 is a perspective view of the arched boiler with the end removed. Fig. 2 is a perspective view of boiler tubes, a side view of which in a single tube is represented by fig. 3. As the invention is so easily demonstrated, its application requires no particular reference to parts by such signs as letters; we have therefore to describe its principal features and advantages, rather than the relative parts which are employed in the construction of any boiler.

This invention consists in forming cylindrical flues, curved fire arches, and (if deemed advisable) the curved shells of boilers, of corrugated plates of metal. The metal being rolled in this form, gives great additional strength and secruity to the arches, and makes them self-sustaining, without the aid of the immovable stays with which most boilers, especially high pressure ones, are obliged to be furnished, and which add so much to the unnecessary weight, and increase their liability to burn out and scale.

The fire arch of a locomotive is required to be stayed with a great number of angle iron ribs and braces, and the iron of the arch itself must be very thick. Marine boilers also have to be braced and stayed throughout. To obviate these evils (for evils they are in a certain sense though not in another.) Mr. Montgomery employs arches of corrugated plates and cylindrical corrugated flues. An evident advantage gained by this form, is a great extension of heating surface, and greater strength of metal in less space than in common fire arches.

It is contemplated to use the corrugated surface in the flues and arches of boilers, as shown in the above engravings, and when great strength and lightness are required, the shell of the boiler should also be made of the corrugated plates. By employing the corrugated plates in the crowns of furnaces, in the tops of flues, and the bottoms of cylindrical boilers, a great extension of effective heating surface is obtained, consequently the sufficient steam generating surface may be had in a reduced space without any increase in the weight of the metal. Experiments have proved that the corrugated boiler plate, in an arched form, with the flutings running in the direction of the arch, possesses such great strength that it allows the disuse of many stays, every one of which is a lodging place for scale, and thus a great evil is removed. There is, therefore, a saving in the weight and cost of stays, and of much labor in their construction. In long flues it will probably confer the additional advantage of obviating the evils of the expansion of the metal by which the boiler heads are strained and become leaky. It has been ascertained that the saving effected in the weight of boiler plate alone, by the corrugated plate, amounts to a large percentage of the total cost, and if to this be added the saving of weight and cost effected by dispensing with many braces and stays, besides diminishing the space required for the accommodation of steamship boilers and those of locomotives. The improvement is one of very great importance and worthy of the attention of every person interested in the safe and economical use of steam power. The boiler of a steam engine is like the fountain-head of a stream—if it is not good the engine is of little use.



Improved Hand-Truck for Wheeling Bales.

Messrs. Frederick and Jacob Nishwitz, of Williamsburgh, L. I., have taken measures to secure a patent for a very valuable improvement in hand-trucks. The improvement relates to the construction of the frame, and consists in the constructing it of iron, and having it so arranged that the front piece of the truck is firmly supported and braced by lips, and secured to that part which requires great strength and firmness for loading, by inserting the front piece under the bale or other article to be drawn, and then by depressing the hands to make them act like a heaving lever to roll back the bale easily and quickly on the frame of the truck.

Improved Water Gate.

Mr. J. R. Howell, of Springfield, Mass., has invented an improved anti-friction balance gate. The gate is of a curved shape, the curve forming part of a circle, with one or more arms extending from the inner or concave side of the gate to a point which is the centre of the circle of which the gate forms a part. The arm or arms work upon a pin or pivot at the point above mentioned, said pin being sufficiently strong to resist any pressure that may act upon the concave or inner surface of the gate.

This gate is for wheels, and the water, by a peculiar system of packing, acts in such a manner as tends to keep it water-tight.

Improved Machinery for Dressing and Jointing Staves.

Mr. John Hall, of Vermont, Fulton Co., Illinois, has taken measures to secure a patent for machinery to dress staves, a kind of machinery which is very important in our country, and every improvement made on it, is of great value, because there is such an innumerable quantity of staves used up every year. The staves are forced in between cutters by means of a gate having a series of vibrating stops operated on by springs, these stops pass horizontally through the vertical centre piece of the gate, and the stave to be dressed is placed against *it*, the lower end entering a slot immediately above the cutter; the gate by a system of levers, is then forced down, and the upper stop being over the top of the stave, the said stave is forced between the cutters as far as the gate vibrates; when the gate ascends, the stop immediately beneath the upper one is forced out by its springs as soon as it gets above the stave, and it bears upon the top of the stave, when the gate again descends, and so on till the whole stave is forced betwen the cutters.

In connection with dressing the staves, there is a jointing operation, whereby the whole of the trimming of the stave is finished at one operation. A set of jointing knives are attached to the upper part of the gate and act upon the stave as the gate descends. The gate, therefore, in descending is forcing a stave between the dressing knives below, at the same time the jointing knives on the top of the gate are jointing the stave.

New Churn.

Mr. George B. Clarke, of Leonardsville, Madison Co., N. Y., has applied for a patent for an improvement on a churn, which is stated to be very valuable, and owing to which, the term "Excelsior Churn" has been applied to it. The body of the churn is made to rotate and the cream or milk is agitated by stationary dashers in the interior. A stream of hot or cold water, as is required to keep the temperature at about 62°, is pumped by the action of the churn, through an interior tin chamber, the water entering at the one side and coming out at the other, or the continuous motion may be suspended at pleasure. A stream of air is also sent by a tube into the milk, &c., by annular passages to supply the necessary air for the ventilation of the churn.

Improved Method of Manufacturing Twisted Gun and Pistol Barrels.

We learn by the London Mechanics' Magazine that a Mr. Aaron Rose, of Worcester, England, has just enrolled his description of a new method of manufacturing twisted gun barrels, which is thus described:—An iron or steel rod, or a mixture of both, of sufficient length and thickness to form a gun or pistol barrel, is wound into a compact coil, and then placed in an anvil having a semicircular groove, where it is submitted to the action of the tilt hammer. The coil is then submitted to a welding heat in an air furnace, then hammered and rolled, a stream of water being used in both cases to wash away the scale.

The tilt hammer has a groove on its face corresponding with the anvil to act upon the coil, before the welding.

Anotta Dye.

This beautiful color is one of the readiest known to the good housewife, and as there are some who have to make it, we will give them the simple direction. First be careful to procure the article pure, as it is one very subject to adulteration. Cut it into small pieces and boil it in soft water with an equal weight in pearlash, in a copper boiler, say one pound to four gallons of water. Rinse the articles to be dyed in clean water and let them boil some time; take out and rinse. The quantity of anatto used must be regulated entirely by the depth of color required. A little experience will soon teach that.—[American Agriculturist.

[This is a color which none of our farmers should dye, because it is so fugitive. If it is exposed to the sun for five minutes, it fades; for ribbons &c., not exposed to the sun it may do very well, but it is a very poor color, although beautiful. Anotta is employed to dye a salmon and an orange color, but it should never be used for woolen goods.

Scientific American

NEW YORK, MAY 17, 1851.

To Our Mechanics---"Come Let us Reason Together."

It is an undeniable fact, that the great majority of our mechanics are not reading men, that is, they do not read useful and instructive works. We do not mean to say that our mechanics cannot, and do not read at all, far from it, for there are but few among us who have not received the elements of a common education; but we do say that the majority do not make a practice of reading works which expand the intellect and improve the mind. The works which they make a practice of reading, tend to grossify and puddle the mind. This is one reason why there are so few among our mechanics capable of taking charge of and managing the business they have learned as trades. It is also a reason why so many of them are rough in speech, and uncourteous in manner. There are many, very many men in our country who were once journeymen mechanics, but who now occupy high and important positions in the republic. We rejoice at this, but we are not a little sorry to add that the majority of them had to leave their trades, and become lawyers,—they at least did not move out from the workshop direct to the House of Representatives, or the Senate Chamber. Fillmore, our President, and Douglass, Senator from Illinois, were once tradesmen, but they arose to their present positions, not through the tailor's or cloth-dresser's bench, but the lawyers bench. There is not a solitary individual in our country, who has, from a lowly, elevated himself to a high position in society, but has been and is a reading man,—one who has read and does read books that are books.

Those mechanics who rise to foremen and employers, are the reading men of the mass; they aspired to be something and adopted the best means to secure the desired ends. Worth and intelligence always command respect from those whose respect is worth striving for. We are not pleading for a gross struggle for wealth, although a reasonable amount of it—as a provision for sickness or old age, is a laudable and proper desire, but we plead first of all for an elevation of character as a means to a social elevation among men of *real worth*. Wealth without worth will never make a man pass among gentlemen, as a current coin, but the man who is industrious, intelligent, trusty, and courteous, will always pass for the genuine metal.

Industry, honesty, and intelligence are qualities of character more valuable than gold seven times purified. A talented, first rate handy mechanic, without such qualities will never rise, for he cannot be trusted. It is not the *smartest* man who is always selected to be a superintendant among his fellow workman; it is he who combines the greatest amount of abilities with those qualities which give his employers confidence in his *moral* worth. We have often been solicited to furnish competent mechanics to take charge of new establishments, and have found it very difficult to secure, at any time, the *proper man;* and no further back than last week a gentleman writing to us from the South, uses the following language: "Last summer, I visited the North and purchased machinery for the manufacture of chairs, and after considerable trouble hired a man alleged to be competent to superintend the whole business. I have not yet been able to commence operations, owing to the incompetency in every respect, of the man in whom I trusted to superintend my business; can you send me a man with the requisite qualifications, and above all let him be a gentleman?" We cannot send him the kind of man he wants and requires. Our real good men are scarce,—they soon find situations, and we believe there would be more good situations for men (manufacturing establishments would increase) if we had more men capable of filling them honorably and well.

We have now preached a sermon long enough for a week's calm reflection, and next week we will point out the way whereby young mechanics are sure to rise.

Prof. Page's Electro-Magnetic Locomotive.

The following we have noticed in a great number of papers as taken from the Washington Intelligencer, and communicated by Prof. Page. It details the last experiment made with his electro-magnetic locomotive at Washington. We have commented upon it briefly, this week, and may return to the subject next week.

"The locomotive, with the battery fully charged, weighs 10½ tons. With the seven passengers taken on the trip to and from Bladensburg, the weight was 11 tons. Under the most favorable arrangements, *eight pounds* are required to start a ton on a perfectly level rail, and seven pounds will barely keep a ton in motion. Ordinarily, upon railroads, the allowance is ten pounds to a ton, but this applies only to cars unincumbered by machinery. The friction of locomotive machinery renders its draught far greater, and can only be accurately ascertained by experiment in each case.

The magnetic locomotive, the first of its kind ever made, is imperfect, and, from the newness and stiffness of all the work, it runs exceedingly hard. We will take 200 pounds, which is below the actual power required to keep it in motion on a level portion of the road. A horse-power, upon the usual estimate, is 150 pounds 2½ miles an hour, or 375 pounds 1 mile an hour. The speed of the magnetic locomotive is, we will say, 15 miles an hour on a level road (it has in fact made more) and its traction 200 pounds. We have, then, 375 pounds 1 mile an hour for one horse, and 200 pounds 15 miles an hour for the locomotive, which gives *eight* horse power. But the engine has more than this. It has greater power at a slow speed, and must have, by all reasonable estimates, twelve horse power; which, as I said before, is about one half its proper capacity. One of the most serious defects arises from a want of insulation in the helices.

After the engine was placed on the road it was found necessary to throw out of action five of the helices, and these at the most important point in the stroke. This difficulty could not be remedied without taking both engines entirely out—an undertaking for which I had neither the time nor means, as the track with which we are now accommodated is soon to be filled up for the purposes of the Railroad Company. Another serious difficulty encountered, was the breaking of the porous cells in the battery, causing a mixture of the two acids, and the interception of a large portion of the power. I had great difficulty in procuring suitable porous cells, and the manufacture of such as I needed was, after great expense, given up by two of the best pottery establishments in the country as a thing impracticable.

It was, however, accomplished through the ingenuity of Mr. Ari Davis, my engineer, but they were made of weak clay, and have now, from frequent use, become so much impaired as to break from the slightest causes. Before we started, two of them broke, and the defect was only partially repaired. Not far from Bladensburg two more gave way, and detracted at once greatly from our working power. On our return, about two miles from Bladensburg, three more gave way, and we were reduced to at least one half of our power. The running time from Washington and Bladensburg was thirty-nine minutes. We were stopped on the way five times, or we should have probably made the run in less than thirty minutes. Going and coming there were seven stops and three delays—that is, the engines were backed three times, but without entirely losing headway. It is a very important and interesting feature of the engine, which I demonstrated some years since, that the reversing power is greater than the propelling power; it is nearly twice as great. When the engine is reversed, the magnetic electric induction is in favor of the battery current, and augments its effects. The defect of the cells is easily remedied. The trouble growing out of the oscillating motion of the car can all be obviated by using rotary instead of reciprocating engines. The greatest speed attained on our last trip was about nineteen miles an hour, and about seven more than in any former experiment."

In the foregoing description of Prof. Page's Electro-Magnetic Locomotive we have endeavored to discover what he means by "*eight* pounds are required to start a ton on a perfectly level rail." There is no mechanical power—laboring force—in mere dead weight. He says, "a horse-power is 150 pounds moving at 2½ miles per hour," and the speed of his locomotive being 15 miles per hour its total weight 11 tons, gives it 8 horse-power, but he says it has more power when moving slow than fast, and its actual power is all of 24 horse.

It is very evident that the correct data for estimating the power of a locomotive, is not clearly understood—or rather, let us say, not clearly set forth in Prof. Page's communication. The power of a locomotive is not estimated by the old fashioned rule of a horse-walking at the rate of 2½ miles an hour and drawing 200 lbs. over a pulley, as estimated by Boulton and Watt. Upon a level railroad, a horse can draw 10 tons at the rate of 2 miles per hour, but as that eminent engineer, Pambour says, "it is an unintelligible fiction to pretend to assimilate locomotives to horses." The formula for calculating the power of a locomotive is $P=Wvp-f$, or $P=St-f$. The first formula is, P, the power, equal to W, the weight multiplied into v, the velocity of the pistons, into p the pressure of steam in square inches on them, less f, the friction of the parts of the engine. The second formula is P, the power, equal to the quantity of steam, S, raised in a given time, t, less f, the friction of parts. The power of an engine is in the steam, and the quantity that can be raised in a given time, is well known by the amount of the heating surface of the boiler. The proper rule for estimating the economic value of an engine, is its cost, and the number of tons it can draw at the quickest rate with the least amount of fuel, and for the longest time with the least repairs. If it is meant by the 8 lbs. mentioned above, "the pressure and velocity," then we must take into account that every ton moving at the velocity of 30 miles per hour, experiences an atmospheric resistance of 12 pounds. The power of locomotives is not yet fully understood, we mean as it relates to their weight, evaporating power, and the load they can draw in a given time. Some locomotives of 14 tons, are more effective than others of 18 tons. There is not a single locomotive engine builder in our country but could build an engine of 10 tons, and warrant it to run at the rate of 30 miles an hour on a level rail with a light train, say 20 tons, (we keep within reasonable bounds).

As far as we have been able to search back, this electro-magnetic locomotive is not the first that has been tried: in 1843 an electro-magnetic locomotive, weighing 5 tons, was tried by one Davidson, in Scotland, but it was a failure, and so was one by a Mr. Little, in England, which was tried a few years afterwards. We do not feel, like some, in reference to the appropriation made by Government for Prof. Page to make experiments in the application of electro-magnetism as a mechanical power; nor do we think one better qualified to make the experiments could have been selected. We like to see a prudent liberality in making appropriations for scientific purposes, and we should like to see more economy in some branches of the government, so that more money might be devoted to advance science and art. It is our opinion, however, that electro-magnetism is far inferior to steam power, and far more expensive. It has been stated that electro-magnetism would be more safe than steam, as there would no explosions. We apprehend, that as much danger might be anticipated from the acids and the gases of and for the batteries, as from explosions. A lump of coal is a more safe and convenient supporter of combustion than a carbuoy of sulphuric acid. It is the *combustion* (using the term for plainness) of the zinc in the battery which generates the electric force, just as the combustion of coal generates the steam force. Will the zinc give out more force than the coal required to smelt it? A most eminent chemist, Liebig, says no, and we believe he is right; but we have extended this article to an undue length, and will not enter at present into details of the comparison of steam and electro-magnetic economy.

Notices of Books.

The Stones of Venice: By Ruskin; published by John Wiley: Broadway, New York.—This is a valuable volume by the author of "The Seven Lamps of Architecture." It treats of the buildings of Venice—their history, style, decorations, and construction. Any work on art by Mr. Ruskin is of high value both to the artist and the thinker; and in this work, originality, a love of truth, with liberty of speech, are impressed on every line. He details the rise and fall of the once celebrated "City of the Sea," and writes her history in her stones. The illustrations are numerous and "have tongues." As a critic of works of art, Ruskin stands high. He is not squeamish about fine words, but uses those which tell the truth in the clearest manner.

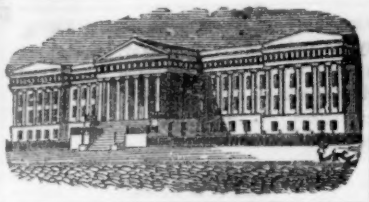
Episodes of Insect Life.—This is a beautiful volume, published by J. S. Redfield, Clinton Hall, this city. It is illustrated with some of the most quaint and beautiful figures that we have ever seen. The object of the author is to render the study of Entomology—the science of insects—more popular and attractive to the generality of mankind; and well has the *incog.* author, who styles himself "*Auschiti Domestica*," accomplished the object intended. We have never read a more attractive and instructive book. Those who have neither the time nor the patience to study this subject fully, but who have a desire to know something about it, should get this book; and even those who believe themselves well versed in it, will find much that is new and everything to delight.

The Turner's Companion: Henry Carey Baird, of Philadelphia, successor to E. L. Carey.—This book treats of concentric, elliptic, and eccentric turning, with directions for using the eccentric cutter, drill, vertical cutter, and circular rest, with patterns and instructions for using them. The first thing described is the lathe, by which we learn that this machine was known to the ancient Greeks and Romans, and was used by them in turning urns and vases, and adorning them with ornaments in basso relievo. It is illustrated with a great number of engravings, such as tools and works of art, and it explains how the machinery is used, and how the works are produced. It does not treat of power-turning, such as Blanchard's lathe, but it contains a great deal that is exceedingly interesting, forming a very useful book, which should be found in every mechanics' library.

Fruit, Flower, and Kitchen Garden: Published by Henry C. Baird, Philadelphia—This is a republication of the work of Neil, who was thirty years Secretary of the "Caledonian Horticultural Society." Although the work relates principally to the science of horticulture as practiced in Scotland, still it is a book that is much wanted among us, for we are in a measure but beginners, in some branches of it at least. The training of fruit trees is well treated, and we commend it heartily to all our farmers. The American apples are better than the British, but not our pears, cherries, and gooseberries. Much information is contained in this work about these fruits. Every farmer and every man who has a garden, if it is no larger than a cabbage bed, should own such a book.

Premium Offered.

Mr. E. Anthony, of New York city, offers a reward of $500 for the most valuable improvement in photography, which shall be made before the close of the present year. The improvement may be in any branch of the art, or of any nature, and the artists of England, France and Germany are free to compete for the prize. The following committee will make the award:—Prof. Morse, Prof. Draper, of the New York University, and Prof. Renwick of Columbia College.



☞Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.
FOR THE WEEK ENDING MAY 6, 1851.

To Linus Yale, Jr., of Newport, N. Y., for improved Lock and Key.

I claim, first, the self-detaching and attaching key, for the purpose and object described.

Secondly, in combination with said key, I claim a powder-proof key-hole, consisting of two or more parts so constructed that the outer part is turned by the key, while, at the same time, the inner parts, with the pod or pods of the key enclosed are disconnected and moved entirely away from the outer, the same movement causing solid metal to occupy the space left, and thus to effectually bar an entrance of any kind to the lock, when its parts are in a position possible to be unlocked.

To Thomas Vanderslice, of Valley Forge, Pa., for improvement in Meat-Cutting Machines.

I claim the herein described mode of adjusting the cutters by means of the adjusting plates.

To Charles Burt, of Belfast, Me., for Exploding Harpoon.

I claim, first, the interior of the harpoon made as a pistol barrel, with percussion lock protected from water or outward accident, and the trigger of which can be actuated by means of a pull on the line, and the resistance of the flesh, substantially as described.

Second, I claim the making the point of the harpoon the projectile which is shot into the whale, in the manner and for the purpose substantially as described.

Third, I claim the arrangement of the trigger in the shank under the barb, in the mode described, preventing the explosion of the charge until the line is drawn by the whale or the harpoon.

To J. R. St. John, of New York, N. Y., (assignor to James Renwick, G. F. Barnard & E. B. St. John,) for improvement in Hand-Logs.

I claim, first, the arrangement of the log glass, lever, pinion, and wheel, whereby the motion to the clock-work by the reel is communicated to the index during a definite period of time, determined by turning the log glass on or off the lever, the parts being so proportioned, and the dial so divided, that the index, moving while the sand is running in the log glass, shows the rate of speed at which the vessel is moving per hour of time, during fourteen seconds, or any other known space of time; the parts being arranged and operating substantially as described or in a manner equivalent, to produce the same results by like means.

Second, the application of a parachute to the purpose of a "log ship," and the combination therewith of the cylindrical wedge or its equivalent, to enter between the tubes to keep the "log ship" spread, when in the water, and disengaged when hauled on to "fetch home," so that the log ship closes and turns end for end with the water, and is easily hauled on board, said log ship being used with the reel and registering parts herein described and shown, or with any other means of supplying and determining the amount of line run out during a known period of time, substantially as described and shown.

To Nelson Goodyear, of New York, N. Y., for improvement in the manufacture of India Rubber.

I claim the combining the india rubber and sulphur, either with or without shellac, for making a hard and inflexible substance hitherto unknown, substantially as herein set forth.

And I also claim the combining of india rubber, sulphur, and magnesia, or lime, or a carbonate, or a sulphate of magnesia, or of lime, either with or without shellac, for making a hard and inflexible substance hitherto unknown, substantially as herein set forth.

To J. R. Kain & Spencer Lewis, of Tiffin, Ohio, for improvement in Bedstead Fastenings.

We claim providing the upper section or part of the cylindrical box, with a triangular and two parallel wedge-shaped wings, made sharp and projecting from its periphery, in such a manner that the triangular projection shall open a groove or way in the post, which shall be closed by the entrance of the parallel wedge-shaped wings, which follow as the section is driven into the post, and thus crowd the wood in front of the shoulder of the triangular projection, and form a complete lock thereto, as described.

We also claim dividing the cylindrical box longitudinally into two equal parts or sections, the line of division inclining upward at an angle of about 10 degrees from a horizontal plane, by which the edges of the upper section are made to serve the purpose of wedges for forcing the teeth of the lower section into the post and holding it securely, as described.

To J. A. Cutting, of Philadelphia, Pa., for improved Spark Arrester.

I claim, first, the air flues in the lower part of the diaphragm constructed in the manner and for the purpose herein described.

Second, I claim the pipes or conductors in combination with the air chambers (two) arranged substantially as herein described.

Third, I claim the combination and arrangement of the air flues with the air chamber, reverberating cone, inclined and curved flues, for the purpose and in the manner herein fully set forth and described.

To Nelson Newman, of Cincinnati, Ohio, for improvement in Pumps.

I claim the combination and arrangement of the valve chest, water passage, pump cylinder, and air vessel, as herein described, so that the whole can be cast in a single piece, and the valves and suction pipe supported and secured in place by another piece also cast in the form herein described, whereby the cost of making the pump, and its liability to get out of order, are both lessened without impairing its efficiency or rendering it more difficult to repair.

To R. E. Schroeder, of Rochester, N. Y., for improvement in Lime Kilns.

I claim the flues encircling the cupola and provided with apertures or flues (five) for admitting the heat and flame to the action upon the limestone, from various points, substantially as described, in combination with the air chamber encircling the cupola as described.

And I claim, also, the aperture and passage therefrom, for saving the heat arising from the manufactured lime while being removed, all operating conjointly in the manner and for the purpose herein fully set forth.

To John Gorrie, of New Orleans, La., for improved process for the artificial production of ice. Ante-dated Aug. 22, 1850.

I wish it to be understood that I do not claim as my invention any of the several parts of the apparatus in themselves, but I claim, first, the employment of a liquid uncongealable at the low temperature at which it is required to keep the engine, to receive the heat of the water to be congealed, and give it out to the expanding air.

Second, I claim the employment of an engine, for the purpose of rendering the expansion of the condensed air gradual, in order to obtain its full refrigeratory effects, and at the same time render available the mechanical force with which it tends to dilate, to aid in working the condensing pump, irrespective of the manner in which the several parts are made, arranged, and operated.

Third, I claim supplying the water gradually and slowly to the freezing vessels, and congealing it by abstracting the heat from its under surface, substantially as set forth.

And lastly, I claim the process of cooling or freezing liquids by compressing air into a reservoir, abstracting the heat evolved in the compression, by means of a jet of water; allowing the compressed air to expand in an engine surrounded by a cistern of an unfreezable liquid, which is continually injected into the engine and returned to the cistern, and which serves as a medium to absorb the heat from the liquid to be cooled or frozen, and give it out to the expanding air.

To Florentin Joseph de Cavaillon, of Paris, France, for improvement in purifying Illuminating Gas.

I claim the purifying powder for illuminating gas, said powder consisting of sulphate of lime, either natural or artificial, in connection with some inert substance, or substances, partly inert and partly rendered purifiers, when compounded in the proportions substantially as described herein.

To T. J. Sloan, of New York, N. Y., for machine for assorting screw blanks, etc.

I claim the combination of the series of shifting ways, with the main or stationary ways, for the purpose and in the manner substantially as specified.

And I also claim the detector, substantially as specified, in combination with the stationary and shifting ways, substantially in the manner and for the purpose specified.

RE-ISSUES.

To J. B. Hyde, of New York, N. Y., (assignor to T. J. Croggon, administrator of T. R. Williams, deceased), for improvement in machinery for hardening bats in felting, &c. Originally patented Dec. 14, 1840.

What is claimed as the invention of the said Thomas Robinson Williams, is the method substantially as described, of forming the bat by the combined use of two endless aprons which receive the sliver from the doffer, or a carding engine, or otherwise, between them, and from the bat on one of the belts, whilst the other acts as a support, substantially as described.

To J. B. Hyde, of New York, N. Y., (assignor of Thomas Croggon, administrator of T. R. Williams, deceased), for improvement in machinery for forming bats for felting, &c. Originally patented December 14, 1840.

What is claimed as the invention of the said Thomas Robinson Williams, is, first, the method substantially as described of hardening the bat, by passing the same between two series or tiers of rollers, covered with cloth, or otherwise, and arranged over each other, the one series being provided with a reciprocating, endwise motion, for the purpose of felting the bat; and the other series with a progressive rotary motion, for the purpose of feeding the bat through, with or without the use of a trough, containing hot water and soap-suds or other matter, substantially as described.

(For the Scientific American.)
Practical Remarks on Illuminating Gas.

[Continued from page 270.]

The process of making oil gas is much more simple than that of coal gas; as the purification is wholly dispensed with; the constituents of the oil being such that there is no combination of sulphuretted hydrogen or ammonia. In the arrangement of the generating apparatus, the two processes differ essentially. The oil is not introduced into the retort and subjected to decomposition in quantity as is the coal; for in such a case the greater part of the oil would distil over, without undergoing much alteration, and the portion only which is in immediate contact with the heated surface would be converted into combustible gas. What is required and the chief object to be obtained is, to bring a small quantity of oil to a high temperature, in order that all its particles may be decomposed at once; and for this purpose the following arrangement for generating is used:

The ordinary oil gas apparatus consists of a small cylindrical retort of cast iron, set in a furnace, and brought up to a proper temperature by fire which is conveyed around it by suitable flues. The retort is partially filled with coke, brick, or some other similar material, for the purpose of presenting a larger amount of heated surface; the oil is then conducted from a reservoir above, through a pipe in a small stream into the retort upon the heated surface, when it is immediately decomposed; gases are given off, accompanied with a considerable quantity of vapors which are liquid at common temperatures, and a large deposition of carbon takes place in the retort.

The coke or bricks are changed every fortnight or three weeks, as the interstices become obstructed by the deposite of carbon. The best results are obtained when this gas is produced at a low temperature; as this temperature suffices to convert the oil into gas, but is not sufficiently high to decarbonize it to any great extent. The secondary and the only product of this distillation is an oily fluid, consisting of tryile, dytryile; and a third hydro-carbon.

From the retorts the gas is conveyed into a condenser similar to the one described under coal gas, and from thence, after passing through the meter where the quantity is registered, it is conducted into the gas-holder, where it is ready for distribution, which is performed in the same manner through street mains as the coal gas. In some manufactories, of late years, the gas before entering the street mains, is allowed to pass through a "mixer," by which from 20 to 23½ per cent. of atmospheric air is permitted to unite with it; and it has been stated by the patentee, (for by the way this mixer is a patent article) and others interested, that this is an improvement, and enhances the value as an illuminating agent. It must appear, I think, very evident to an unprejudiced mind that mixing air with gas is a corruption by this foreign compound and not an amelioration. It may be an improvement as regards quantity, I admit, but the quality will be lessened in an exact ratio to the adulteration.

A serious objection to oil gas, is the gradual liquefaction which its important constituents undergo; the gas contains too large a proportion of vapor, which is constantly condensing while standing even at common temperatures; and not only a great loss is sustained, but no small inconvenience from the clogging and stopping of pipes. In England much controversy was carried on between the oil and coal gas companies; large amounts of money were expended in the erection of oil gas establishments, and great skill and strict economy were used to promote success; to sustain them no effort was wanting on the part of those who had invested their money; and, in opposition to facts which were glaringly evident to the most careless observer, it was proclaimed that the illuminating power of oil gas was threefold greater than that of gas made from coal, and that it possessed, therefore, three times its value, whereas it has been demonstrated, that, by converting oil into gas, a loss of nearly one-third of its value for purposes of illumination is sustained. The following extracts from the Enclycopedia Britannica will fully substantiate these statements. "Oil being decomposed at a loss of nearly fifty per cent., the conversion of it into gas, after a protracted but ineffectual competition with coal, has been gradually abandoned on the large scale, even in those places where, from the interests of the whale fisheries, there were the strongest inducements to foster the unfounded prejudices which prevailed for some time against the use of coal gas. The exaggerated advantages which it was pretended would be derived from compressing oil gas, and thus rendering it portable, served to prolong the gross delusion on the subject. Nor were these delusions fully removed, until a demonstration was given of the failure of the scheme, in the decay of costly edifices and expensive apparatus, which, in defiance of all sober calculations had been constructed for carrying it into effect." "The capital expended upon oil gas establishments is actually applied to reduce to the extent of thirty per cent., the intrinsic value of the raw material, which it was pretended to improve in an equal degree; add to this the loss of gas in the main pipes, which is found to be fully twenty per cent., and it follows that the light from oil gas is obtained at twice the expense at which it may be procured from the oil itself."

Manufactories for the generating of gas from oil have also been erected in this country, and the gross delusion has been somewhat prolonged by the introduction of the supposed improvement, viz., the mixer; but the results have been the same, the amounts expended have been sacrificed, the works abandoned and superseded by a cheaper light, and it is now very generally acknowledged by all scientific persons, that gas made from oil can never successfully compete with that generated from coal.

J. B. B.

TO CORRESPONDENTS.

L. R. P., of Me.—When the weight is increased from 200 lbs. to 400 lbs., and changed to the middle of a lever from the end, say from a 5 feet oar to 21-2 feet from the thole-pin, then, if the 400 lbs. made a double stroke, it would exert a double power, but as it makes the same strokes as before, it has only the double weight in the arc, which the weight slowly describes. It brings more strain upon the thole-pin, but does not add speed to the boat. Every loss of pressure on the outer end of the oar, involves a loss of speed, unless it involves a gain of speed.

W. Y. L., of Geo.—The method of gearing so as to make the two stones run in opposite directions, as shown by your sketch, would not be patentable in itself, as it is well known, but we cannot see how any power would be saved,—rather the extra friction by the gearing will be a loss. We admit, however, that the transverse grinding surface action would be superior, and so far as we have been able to discover by examination, there is no patent for the same.

H. C., of L. I., N. Y.—The engine has more labor in proportion to the length of the horizontal shafting it has to drive, but every single machine on the same line requires as much effort of the engines as another. This is as we understand it.

H. T. E , of Ohio.—We do not see any thing patentable in either of your contrivances. The brake is not patentable and the matching machine is essentially the same as the one for which a patent is now pending. We cannot advise you to make an application.

G. M., of N. Y.—We cannot send you a drawing of Mr. Burnet's Horse-shoe Nail Machine at present, but presume we shall present our readers with an engraving of it before many weeks. Mr. Burnet resides in Boston, Mass.

T. A., of Ind.—The lathe to which you refer will not turn spokes, but you can obtain one that will, by addressing Abner Lane, at Killingworth, Ct.

J. R., of N. J.—We do not sell patent rights; our business is to make application for patents, leaving the subsequent management to the inventor or patentee. There is no call for such an improvement as you describe.

P. Y., of Pittsburg.—Glad to hear of your success. We shall be prepared to execute your papers with dispatch, upon receipt of the necessary instructions. Davidson is not known here. We say with you, "success go with him."

H. H. M., of Ind.—We shall examine your case as soon as we can dispose of preceding cases.

H. T., of Mass.—You will find engravings of Mr. Wiley's Blind Machine in No. 27, Vol. 3, Sci. Am.

J. R., of S. C.—We have forwarded your letter of inquiry to the parties interested in the machine, who undoubtedly will give you attention. $2 received and credited as requested.

M. R. H., of Wis.—We are so much occupied with business pressing upon us all the time in the office that we cannot find time to collect the information you require about the rule. If we knew of any one who is engaged in the business we would attend to your wants with pleasure.

S. A., of Pa.—We do not see any thing patentable in your contrivance for saw-mill's. A model in our office possesses essentially the same features.

E. M., of Mass.—If a straight piece of wire which has been rendered magnetical, be twisted in a spiral form, its magnetism will be strangely confused; in some parts it will attract, in others repel the same pole; and this will, in some portions of the wire, take place on its opposite sides. This experiment appears to indicate the disposition of the fluid to flow in a right line.

Deliver J., of Mass.—On page 175, Sci. Am., we asked you why you had not answered our letter which was sent to you more than two months before. We also mentioned that we had your papers as explained in the said letter; please write as soon aspossible.

W. R. G., of N. Y.—It is proved that there is such an engine as you describe on exhibition at the London Polytechnic Institute, older by several years than yours.

A. A. D., of Ala.—We do not know what the expense of the hydraulic ram would be at present, nor if it would practically pay for the same, so as to answer a good purpose in the case to which you refer. We believe it would not, but we will endeavor to see one who has erected and who makes them, and get correct information on the subject.

T. B. H., of Me.—The persons you speak of have not consulted us. We have no account with I. R. at all. We believe your improvement is a very good one and patentable.

L. W., Jr., of Mass.—We think your contrivance different from any other known or used, and incline to the opinion that you can obtain a patent. If you should conclude to proceed, a model of the usual size will be required.

J. H., of Texas.—The model of your invention has arrived and will soon come up for attention. We shall communicate by letter the result of our deliberations.

G. B. R., of Ct.—Your case will come up for examination in its order, in the class of inventions to which it belongs.

E. E., of N. Y.—We have minutely examined the ideas involved in your arrangement, and candidly believe that no patent can be obtained; the contrivances involved in Gwynne's Wheel is essentially the same as yours. When you call upon us again we shall take pleasure in showing you the drawings and description.

G. & Co., of Ala.—The papers you submit for our examination will be attended to at an early date, and you may expect to hear from us by letter relative to the matter.

G. C., of Mass.—We believe your plan of the "wings" to be a patentable subject.

"A. M., of New Market, Tenn.—You may send on a description and sketch of your invention, and we will give our opinion upon it cheerfully.

M. M., of N. J.—Four-way-cocks were used by Leupold upwards of 100 years ago. Trevithick used them subsequently on locomotive engines.

A. A. M., of Mass.—We commend to your attention the series of articles upon the subject of gas now in course of publication in the Sci. Am.

W. R., of Ct.—We have never heard of a double furnace built and applied in the same manner as yours. We believe it to be patentable. Your test of its merits is evidence of its usefulness.

Steam, "Stame."—We have received a communication from Mr. James Frost, engineer, in relation to this subject; it is unavoidably delayed until next week.

R. S., of N. Y.—If you wish to do yourself some good, get an engraving of your invention published in our columns; it will only cost you $10 for such a one as would explain it fully. Everybody who desires to be posted up on what is new in machinery, takes the Sci. Am. Your invention would be introduced to more than 20,000 persons.

R. J. S., of Pa.—Do not go to law about your patent in its present state; you will have to enter a disclaimer, for it is very evident that the document is poorly made out, and does not cover the desired object.

Money received on account of Patent Office business since May 5:

P. D., of Pa., $30; C. S. G., of Vt., $20; F. J. & Co., of N. Y., $55; G. W. L., of N. Y., $55; F. & J. N., of L. I., $40; G. S., of O., $40; E. B., of N. Y., $400; J. H., of Texas, $60; J. S. R., of Ct., $50; D. W. E., of N. Y., $25; S. & P., of L. I., $20; J. C. A. of N. Y., $20; R. D., of L. I., $15.

Specifications and drawings of inventions belonging to parties with the following initials, have been forwarded to the Patent Office since May 5:

S. C. A., of N. Y.; D. E. S., of O.; G. B. C., of N. Y.; S. & P., of L. I.; F. & J. N., of L. I.; T. B., of Mich.

New Edition of the Patent Laws.

We have just issued another edition of the American Patent Laws, which was delayed until after the adjournment of the last Congress, on account of an expected modification in them. The pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office We shall continue to furnish them for 12 1-2 cts. per copy.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office; stating the name of the patentee, and enclosing one dollar as fee for copying.

Scientific Museum.

For the Scientific American.

The Motion of the Earth Rendered Visible.

[We request the particular attention of our readers to the following perspicuous description of the new beautiful experiment which *demonstrates* the motion of our planet.]

The accounts of the interesting exhibition now being made at the Pantheon, in Paris, brought to us by the foreign papers a fortnight since, employ methods of illustration that, to some minds, are obscure. The following may prove less so:

Suppose a pendulum at the North Pole vibrating across a circular table. As the plane (or direction) in which the oscillation takes place does not change, while the table below revolves with the earth from west to east, the pendulum will approach an observer at each oscillation from a new point, its plane will seem to revolve. In twenty-four hours the plane of oscillation will have completed an entire revolution from east to west around the earth's axis: or, more correctly speaking, the plane having been at rest, the earth will, in twenty-four hours, return to its former position.

Suppose now, for convenience of illustration, the earth northward from this meridian of latitude to be flat, the table to be extended from the pole on every side to the meridian, and over it a pendulum of proportional length to be suspended. What is true of the lesser table will be true of the larger: it will revolve with the earth. The pendulum thrown into oscillation above, will continue to oscillate in the plane of its first vibration, and will seem to be approaching an observer successively from points farther to the right.

Now, conceive a small table in the margin of the larger, and over it a lesser pendulum made to oscillate in a plane parallel to that of the larger pendulum. As the lesser table revolves with the larger, it will, in twenty-four hours, accomplish a revolution—not around its own centre, but around that of the larger table, and the lesser pendulum oscillating continually in a direction parallel to that of the larger, will perform an entire revolution round the table. If the larger table and its pendulum be omitted from the illustration, we shall, with a little modification, have the phenomenon now exhibited at the Pantheon.

At Paris, the time required for the return of the pendulum to its first point of departure, is more than 30 hours (30 hours and 40 minutes). That the time must be more than that required at the poles (24 hours) will be obvious if we reflect that at the equator the plane of oscillation of the pendulum, with regard to the poles or any object fixed upon the earth, will not revolve.

Any where between the poles and the equator the time will vary from 24 hours (the least time) to infinity.

In a latitude lower than that of Paris, the time required for the return of the pendulum to its first point of departure, will be more than 30 hours. At Boston it will be 35 hours and 36 minutes, a quantity obtained by dividing 24 by the sine of the latitude.

These facts suggest a new method of determining latitudes: the arc through which the plane of oscillation sweeps in a given time bearing a certain relation to the distance from the poles.

The above experiment has now been ten days on exhibition in the Laboratory of the Scientific School at Cambridge, and has been the centre of considerable interest to persons in the vicinity. The pendulum is 36 feet long, and consists of a slender copper wire less than a medium sized pin in diameter, suspending a pear-shaped weight of four pounds. A few inches above the weight a wooden circle is erected, and upon it, on opposite sides, are placed two movable cards, subdivided by the same number of vertical black marks, an eighth of an inch apart, the centre lines of the two cards being diametrically opposite to each other. When the weight is drawn to the rim of the circle, so as to bring the wire of suspension against the extreme right division on the card, and, after coming to rest, is permitted to sweep, it reaches the extreme left division on the opposite card. The advance of each individual oscillation cannot be readily seen, but after sweeping two minutes, its progress becomes abundantly apparent, and in about 20 minutes it advances nearly an inch, or speaking more correctly, the earth advances that distance while the plane of oscillation remains unchanged.

It may not be uninteresting to your readers to know that this beautiful experiment is so simple that it may be readily repeated in most of our dwellings. Wherever a clear space of from 25 to 40 feet in height, even if it be not more than a foot in breadth, can be commanded, there the experiment may be made. The continuous stairways, from the first floor to the attic, in many houses, provide the desired space. Over this a screw, driven into the ceiling, furnishes the point of attachment. From the screw, by a slender copper or iron wire, of a diameter less than that of a medium-sized pin, a weight of about four pounds may be suspended.

An ordinary steelyard weight, of the larger size, attached to the wire, not by the hook but by the eye to which the hook is fastened, will answer the purpose well. The weight should come within two feet of the floor; place two chairs, back to back, at the extremes of the sweep of the pendulum, some four feet apart, and fix by pins a strip of finely ruled paper (the lines perpendicular) on the top piece of the back of each chair—on the *back* of the chair more distant, on the inside or front of the chair nearest the observer. Now, having tied a thread around the weight, draw it near to one of the vertical marks. When the weight and the wire have come entirely to rest, burn the thread, and the pendulum will commence its oscillations. Note the point of departure, and the mark to which it sweeps on the back of the chair opposite. It will be observed in a few moments that the pendulum will return to a mark a little to the left of that of its first departure, and will sweep to a point a corresponding distance to the right of the mark on the chair opposite. E. W. H.

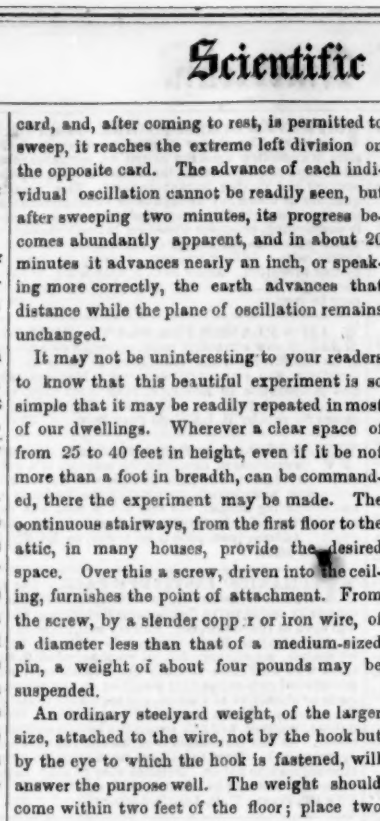
Cambridge, May 8, 1851.

For the Scientific American

Hydraulics.

(Continued from page 272.)

FIG. 49.

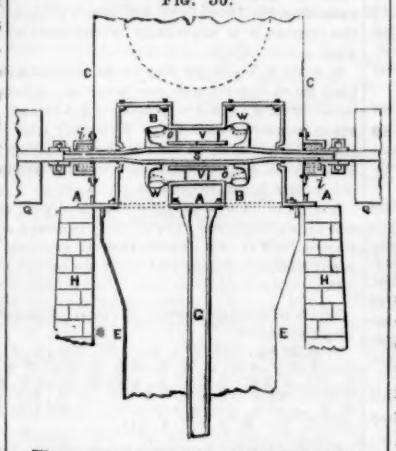


We select the accompanying figure from the MS. of Mr. Z. Parker to illustrate the application of his water wheels and air-tight drafts, to falls of great height. This subject is one for which we solicit the strictest attention, because it is so important, and opens up a new field of Hydraulic Engineering.

Fig. 49 is a vertical section across the axis of the wheel with elevation of draft chambers and double helix.

Figure 50 is a vertical section through the axis of the wheel with the drums, Q Q, (in broken lines) on the shaft, A is the main disc, B B draft chambers, C cylindrical penstock, D is the cover, E is the draft tube, F is the induction tube, G is the column to support the main disc, H is the pit wall, W is the wheel, S shaft, *i i* journal pillows, O is the double helix sluice, V is the double helix partition forming sluice, *h* is the gate.

FIG. 50.



The engravings, without the conduit from the mountain, exhibit the application of the wheel to a fall of 100 feet, and of 1,320 horse power.

DIMENSIONS.—Orifices of wheel, 400 square inches; diameter, 44 inches; 9,597 cubic feet of water discharged per minute; working speed of wheel, 363 revolutions per minute; drums 5 feet 4 inches diameter; speed of belts, 6,084 feet per minute; tension 7,110 lbs. (711 lbs. each belt); width of belt, 13 inches at 40 lbs. tension per square inch; downward pressure on main disc, 894,700 lbs.; upward pressure of water on penstock cover, 548,880; pressure per square inch at bottom of penstock, 26,47 lbs; diameter of pulleys on a line of shafts of the mill for 150 revolutions per minute, 12 feet 1¼ inches.

We shall give the estimated cost of a wheel of this kind in our next. We shall also present Mr. Parker's views on the system.

Treatment of Cancer.

We have had occasion before to call the attention of our readers to the success with which Dr. Samuel Gilbert, of New Orleans, has treated the horrible disease of cancer. We have not done this without positive and satisfactory assurance of the facts being beyond a question. We learn that ex-Governor Tucker, of Mississippi, was induced to apply to Dr. Gilbert in his own case upon the strength of our endorsement, and we have since been informed by letter, and we also notice the successful issue of his case in the New Orleans Delta, a journal of undoubted standing. With this and other corroborating testimony we feel that we are doing the community good by publishing the case of Wm. Baldwin, which was communicated to us a few days since. The editor of the Delta, under date of April 28, says he saw Mr. Baldwin, and bears testimony to the facts we present below, which are given in Mr. Baldwin's own words:

"About eighteen years since, a cancerous affection made its appearance under my left eye. It increased in size, and grew deeper and deeper. Becoming alarmed, I applied to Dr. Hubbard, a highly respectable physician, then of Natchez, who prescribed for me, but he frankly stated that he considered the case a very doubtful one. Subsequently, I applied to Dr. Crane. His treatment failed. In 1848, in company with Dr. Rex, I went to Philadelphia and consulted Dr. Mutter, a distinguished professor of surgery. He advised against the use of the knife. He candidly said that he considered the case incurable, and that I had better submit with fortitude to my fate. Now, despairing of getting cured, I returned home to endure it with patience and resignation. On the 18th of April, having in the meantime suffered severely, and with the prospect of a speedy death, I was pursuaded to put myself under the care of Dr. Gilbert At that time my vision was almost entirely destroyed, the cancer had affected my nose, the adjacent bones had become diseased, and even occasionallally rotting out. I was under treatment until the 15th of June, and thanks be to God and the miraculous skill and perseverance of Dr. Gilbert, I am now well. Without the aid of a knife, he removed the cancer and a part of the bone. My sight has been restored, and my general health is good. I have been a resident and planter of Jefferson county in the State of Mississippi, in the same settlements where I now reside, since 1800. I am a member of the Baptist Church, and in gratitude to God and the truly eminent man who has snatched me, as it were from the grave, I make this statement for the benefit of my fellow-sufferers."

We learn that Dr. Gilbert intends to make this city his permanent residence before long.

Old Oil from the Sea.

A Plymouth paper states that fourteen forty-gallon casks were thrown on shore at Marronet Ponds during the late gale, containing linseed oil in good condition. The casks were covered with barnacles, and considerably decayed, showing that they had been in the water a long time, and all that remained of the iron hoops were the marks of rust. The Boston Advertiser thinks they came from the brig Hollander, of Boston, from Rotterdam, which was lost in Massachusetts Bay ten years ago.

The French have at last claimed the honor of being the first inventors of the locomotive, but such claims will not be easily admitted.

LITERARY NOTICES.

THE SOUTHERN LITERARY GAZETTE: Edited and published by our friend W. C. Richards, Esq., Charleston, S. C., is just entering upon its fourth Volume. It is, unqualifiedly, one of the best literary papers in our country, and we hope our southern friends will not forget that they have so good a paper among them. Terms $2 per annum.

DICTIONARY OF MECHANICS AND ENGINE WORK.—No. 28 of this able work, published by D. Appleton & Co., New York, contains articles on the Mechanic Powers, Mensuration, Metals and Alloys, Metallurgy, the Micrometer, and the Microscope.

"Leonard Normandale, or the Three Brothers," is a very ably written romance just from the press of H. Long & Brother, 43 Ann st.; 25 cts.